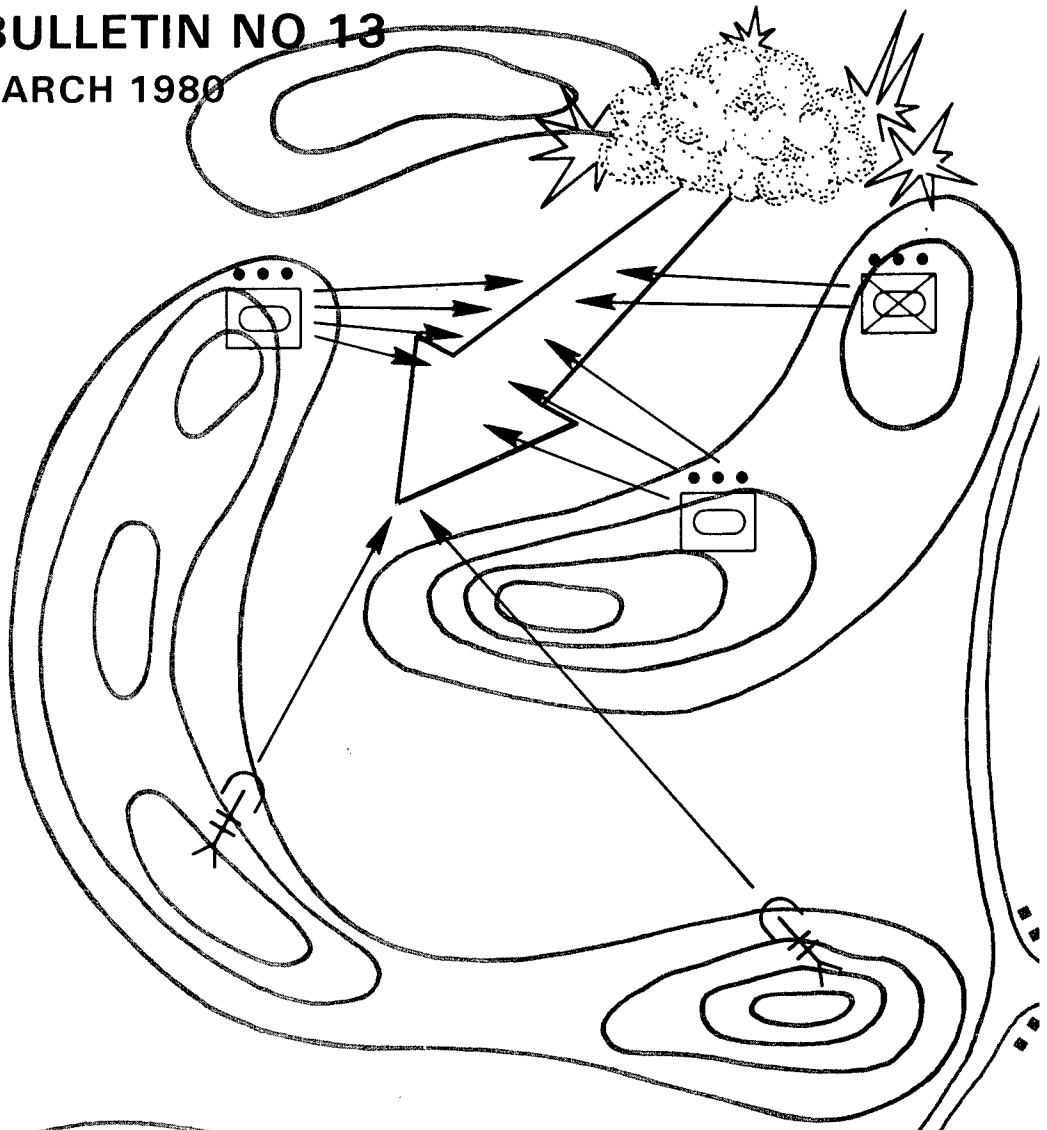
TRADOC BULLETIN NO 13

28 MARCH 1980



BATTLE REPORT

TERRAIN REINFORCEMENT: TANK DITCHES

20010803 039

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	28 MARCH 1980	FINAL

4. TITLE AND SUBTITLE
TRADOC BULLETIN 13. BATTLE REPORT TERRAIN REINFORCEMENT: TANK DITCHES

5. FUNDING NUMBERS

6. AUTHOR(S)

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
HQ U.S. ARMY TRAINING AND DOCTRINE COMMAND
ATTN: ATDO-C
FORT MONROE VIRGINIA 23651

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSORING / MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES
See TRADOC Bulletin 12 dated 31 August 1979

12a. DISTRIBUTION / AVAILABILITY STATEMENT
APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

Terrain reinforcement increases the advantages of the defender. It may consist of extensively engineered obstacles or simply an infantryman's fighting position. Terrain reinforcement counters an enemy's advantage of weaponry, superior numbers, or mobility. This battle report describes one type of terrain reinforcement--the tank ditch--and its use on the battlefield.

14. SUBJECT TERMS	15. NUMBER OF PAGES
	13
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNLIMITED

UNITED STATES ARMY
TRAINING AND DOCTRINE COMMAND

BULLETIN NO 13

BATTLE REPORT:
TERRAIN REINFORCEMENT:
TANK DITCHES

Battle reports are used to disseminate lessons learned about how to fight on the modern battlefield. Data derived from observations, simulations, tests, and/or other evaluations are in the form of TRADOC bulletins entitled **"Battle Reports."** These reports convey important developments of immediate interest to TRADOC agencies and to field commanders. They provide interim guidance until their content can be integrated into appropriate how-to-fight, how-to-support, or other doctrinal publications.

TRADOC centers, schools, agencies, and field commanders are encouraged to submit material for inclusion in future battle reports to **HQ TRADOC, ATTN: ATDO-C, Fort Monroe, VA 23651.**

Contents

	Page
INTRODUCTION	2
THE THREAT	2
TANK DITCHES CAN HELP DO THE JOB	3
PLANNING FOR TANK DITCHES	5
CONSTRUCTION	6
OTHER WAYS TO CONSTRUCT TANK DITCHES	9
WHEN AN ENEMY ATTACKS	10

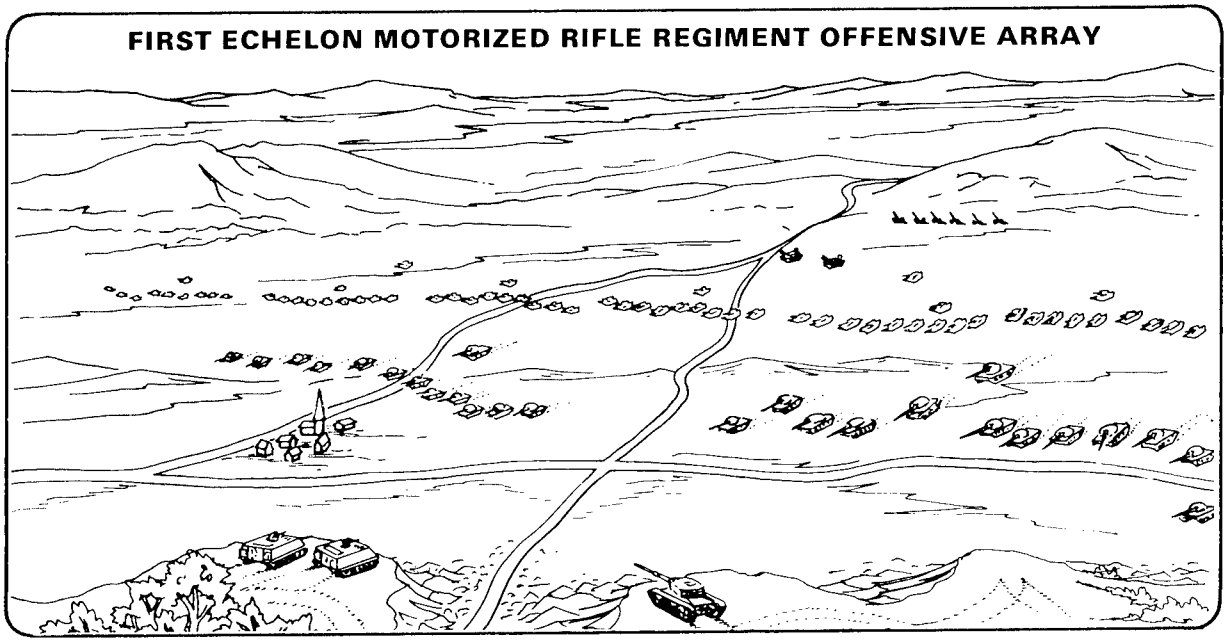
Introduction

Terrain reinforcement increases the advantages of the defender. It may consist of extensively engineered obstacles or simply an infantryman's fighting position. Terrain reinforcement counters an enemy's advantage of weaponry, superior numbers, or mobility. This battle report describes one type of terrain reinforcement—the tank ditch—and its use on the battlefield.

The Threat

The Soviet Army is equipped with large numbers of tanks and infantry fighting vehicles. In battle, these weapon systems follow a doctrine holding that a violently executed offense is the best way to win wars. The Soviets will use speed, surprise, and massed formations to overwhelm their opponents during the attack. They expect to break through a defender with a ratio in attacking vehicles of *up to 6 to 1.*

To achieve this numerical superiority, Soviet offensive doctrine calls for the motorized rifle regiment to attack in two echelons concentrated along a narrow front of 2 to 4 kilometers. The first echelon may have up to 26 tanks and 64 infantry fighting vehicles (IFV), supported directly by six 122-mm, self-propelled (SP) howitzers. The first echelon may also have engineer, antitank, and antiaircraft elements organic to the regiment. The second echelon, containing the balance of the regiment's forces (14 tanks, 32 IFVs), follows 5 to 15 kilometers (10 to 30 minutes) behind the first echelon. The division generally supports the attack by allocating more artillery assets. They may be located with or near the second echelon.

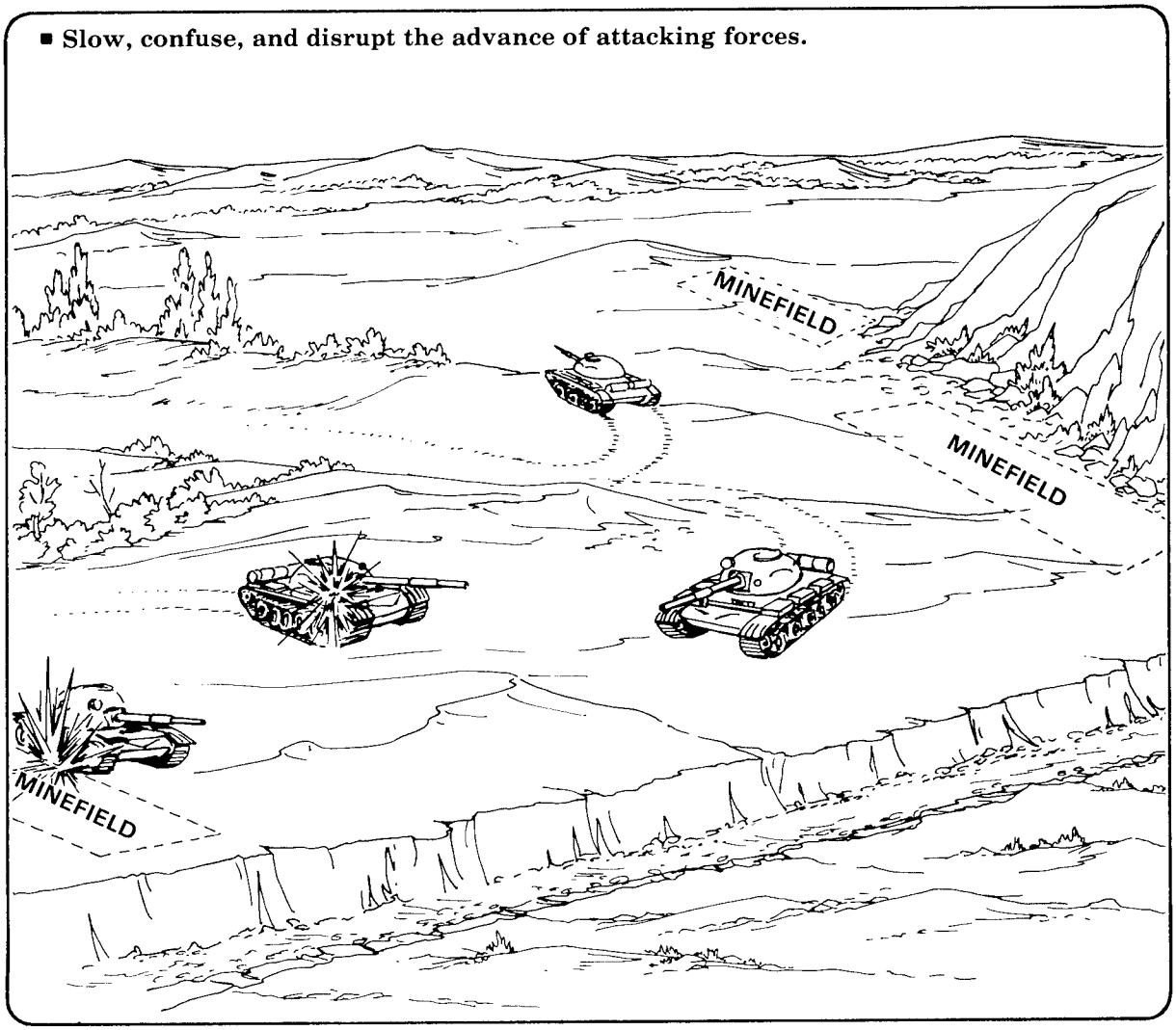


A balanced US tank and mechanized infantry company team of 12 tanks and 12 armored personnel carriers (APC) (four mounting tube launched, optically tracked, wire-guided antitank missiles [TOW]), occupying a battle position in the active defense, may confront a first echelon array of some 90 to 100 armored vehicles. To defeat such a formation, *first slow the attacker's momentum;* that provides time to kill his tanks and infantry fighting vehicles.

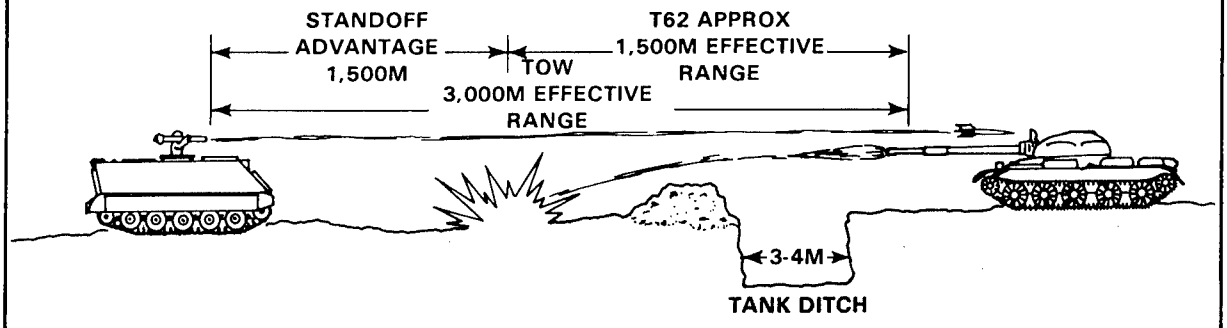
Tank Ditches Can Help Do The Job

Use tank ditches as one way to degrade an attacking force's speed and mobility. Tank ditches impede the advance by slowing vehicles. They also confuse the crews. Well-planned tank ditches can—

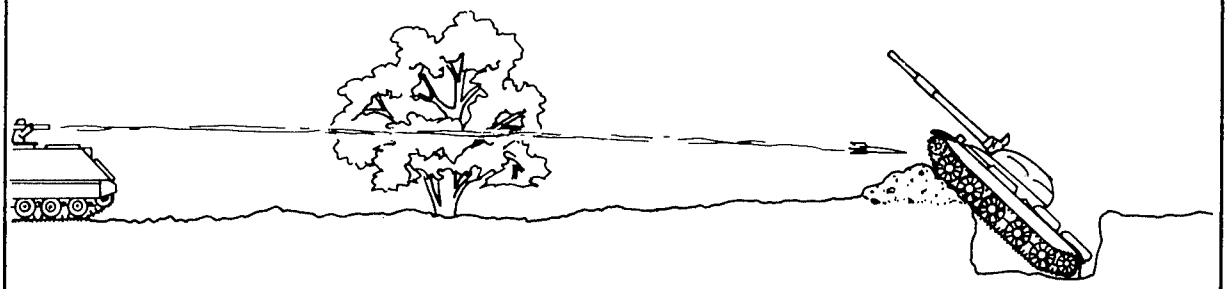
- **Slow, confuse, and disrupt the advance of attacking forces.**



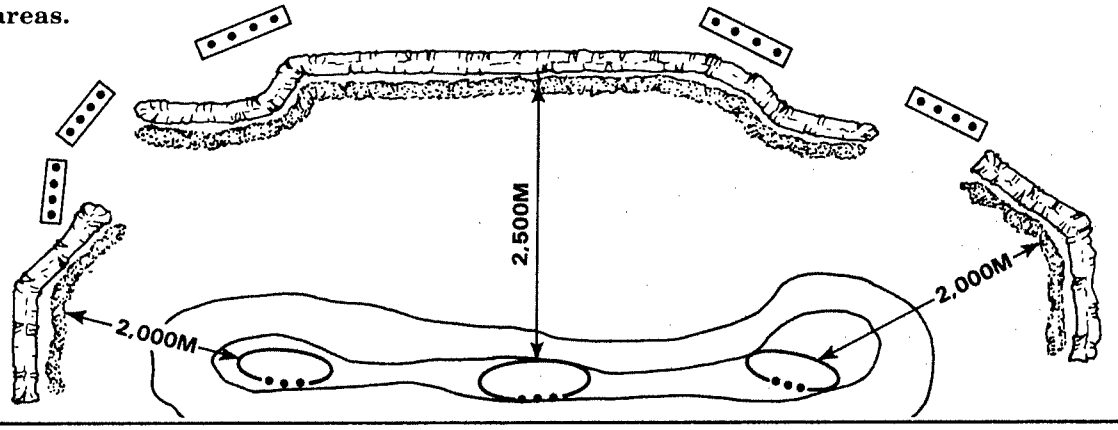
- **Hold attackers at a standoff distance so that defending tanks and antitank guided missiles (ATGM) can engage at ranges most favorable to the defender.**



- **Permit flank and belly shots at armored vehicles attempting to negotiate the ditch.**



- **Protect flanks of battle positions, strongpoints, and lightly defended areas.**



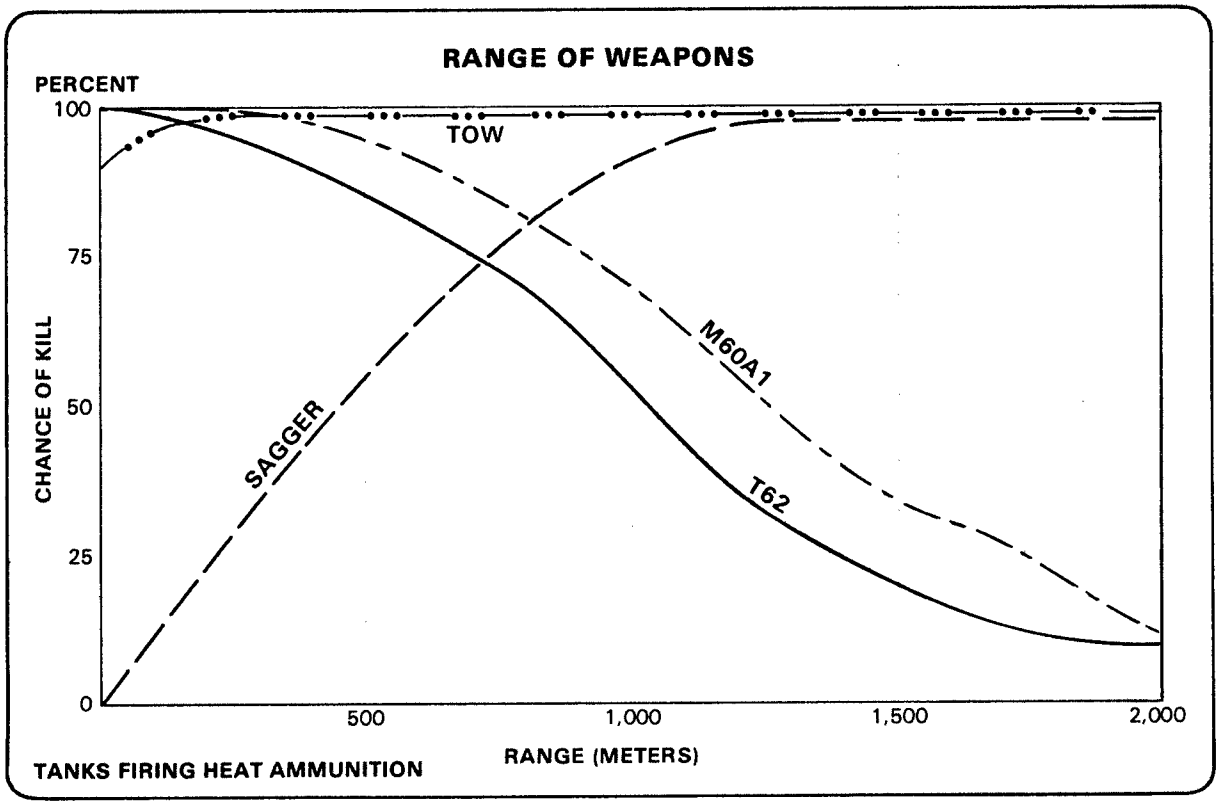
Tank ditches must complement natural terrain obstacles and other reinforcing (manmade) obstacles.

Planning For Tank Ditches

Constructing a tank ditch requires resources sometimes in short supply. Before deciding to employ a tank ditch, consider:

- ***Time*** **— tank ditches take time to construct. A poorly positioned tank ditch is worse than none at all; time and labor used in its construction cannot be replaced.**
- ***Troops available*** **— priorities may call for troop labor in other areas (digging in, emplacing minefields, constructing alternate positions).**
- ***Equipment*** **— the division and corps will have many requests for their limited engineer earthmoving equipment.**
- ***Mobility*** **— obstacles can also limit mobility of friendly forces. Once dug, a tank ditch cannot be filled in quickly.**

A ditch should be used to extend and complement existing obstacles. For example, it should close gaps or lanes between other obstacles like minefields. Yet, it should still allow passage space for a returning covering force or a unit making a counterattack. You must position the ditch so that tanks and ATGMs can engage at standoff ranges where opposing weapon systems are at a disadvantage (see graphic below). Carefully placed defending antitank weapons, firing from covered and concealed positions, will be able to destroy advancing armor before the attacker can negotiate the tank ditch and approach close enough to return fire effectively.



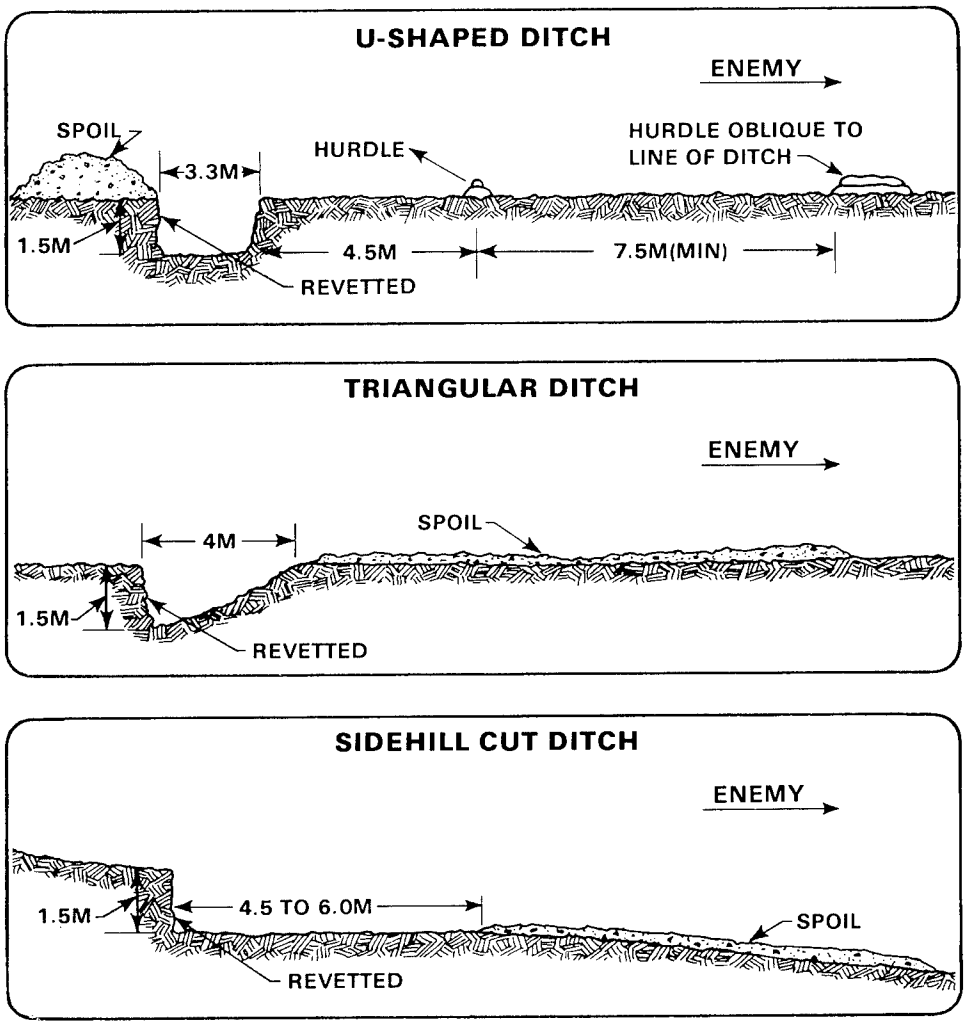
When planning emplacement of tank ditches, keep this in mind: *Soviet commanders rely on carefully rehearsed tactical formations for control in the attack.* You can disrupt the momentum of the attack and force directional changes in attacking vehicles, thus exposing their vulnerable flanks. Imaginative placement of ditches with other obstacles will do it. Follow the standards in the following table.

PLACEMENT OF DITCHES

DO	DON'T
PROTECT THE FLANKS.	BLOCK MOVEMENT OF FRIENDLY FORCES.
USE WITH MINES AND MINEFIELDS.	PLACE PERPENDICULAR TO THE LINE OF DEFENSE.
COVER WITH DIRECT FIRE FROM STANDOFF RANGES.	CONSTRUCT AT THE EXPENSE OF MORE IMPORTANT TASKS.
INTEGRATE WITH NATURAL OBSTACLES.	USE WHERE TERRAIN DOES NOT FAVOR ITS EMPLOYMENT.
CAMOUFLAGE SECTIONS OF THE DITCH.	USE IN HIGHLY FLUID SITUATIONS.
PILE SPOIL ON FRIENDLY SIDE OF DITCH.	THINK IT WILL *STOP*—IT WILL ONLY DELAY.

Construction

Brigades and battalions are not equipped to rapidly dig tank ditches. Construction of a tank ditch often requires support from engineer units. Types of tank ditches are shown on page 7. Note that placement of spoil (excavated soil) increases the effort required to breach or span the ditch; yet the placement denies cover and concealment to the enemy as he attempts to negotiate the obstacle. Further, in the case of the U-shaped ditch, logs or other debris placed in front of the ditch make an expedient means of slowing vehicles and causing them to expose their flanks. Tests by units in Germany show that these ditches can delay attacking forces up to 15 minutes. Ten to 15 percent of attacking tanks get stuck in the ditch or fail to cross. The ditch exposes the tanks to direct fires; this makes it more difficult for the attackers to return effective fire on the defender.

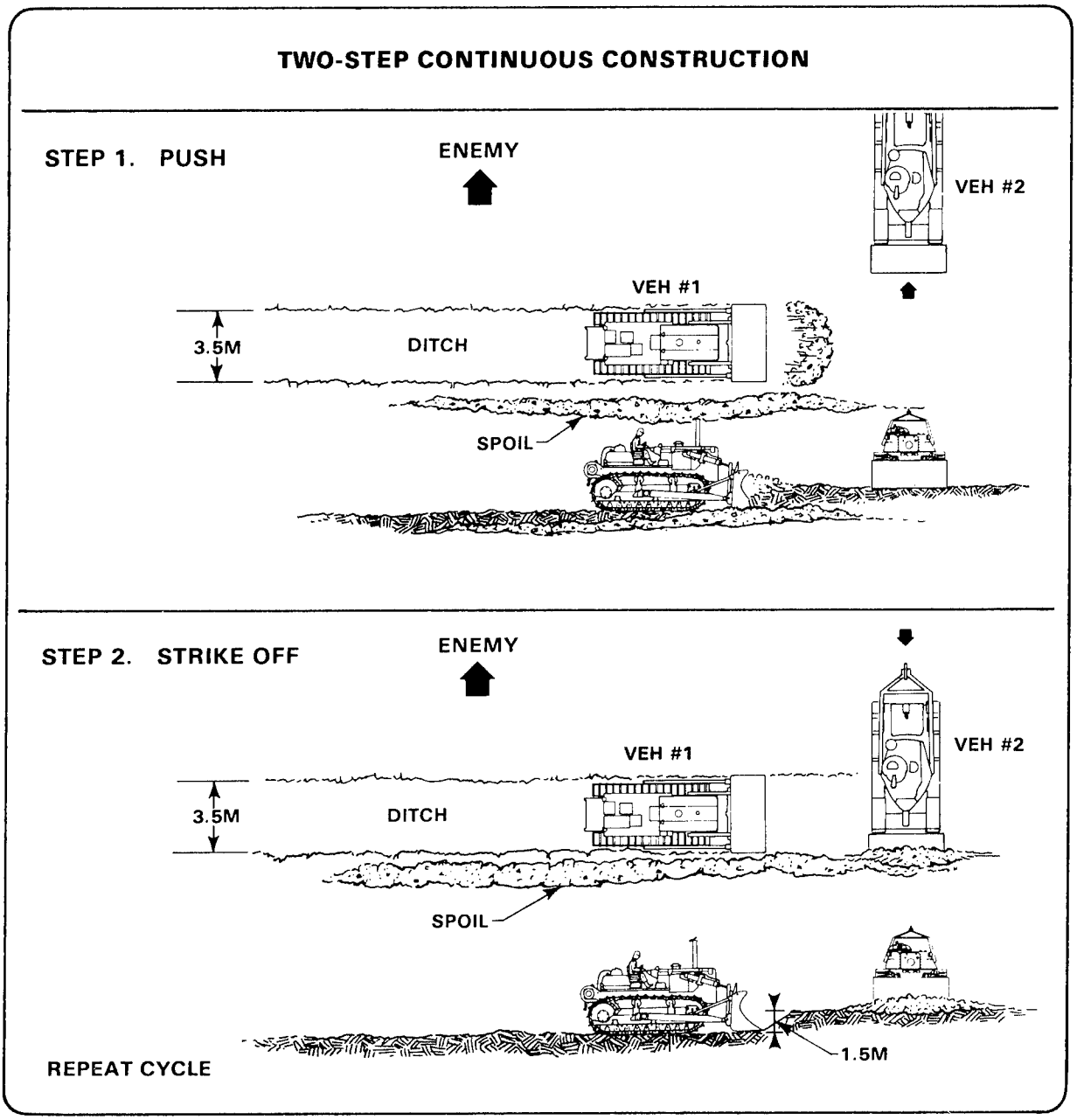


Frequently, you can save time, materials, and manpower by improving existing gullies or ditches rather than constructing entirely new ones. One method is to excavate along natural drainage or contour lines. If the ditch can be made to retain water, so much the better. Muddy soil further degrades mobility. You can place antitank mines in the spoil, and antipersonnel mines in the bottom of the ditch to discourage infantrymen. Depending on type of soil, sides of ditches may have to be reinforced to prevent them from crumbling and to make it more difficult to cross. Direct fire should cover the ditch continuously. Scatterable mines on probable approach routes further slow vehicular movement.

Tank ditches are particularly useful in support of strongpoints. Emplacement of strongpoints, however, requires much time and effort. Use them, therefore, only when it is necessary to physically stop an advancing force. Heavy engineer equipment normally provided for strongpoint construction can also be used for tank-ditch construction.

Rates at which ditches can be dug vary with the soil and equipment available. A two-bulldozer team (or a team of one bulldozer and one scoop loader) can construct a ditch. An effective tank ditch is *at least 1.5 meters deep* and, in the case of the U-shaped ditch, *not less than 3.3 meters wide.* This ditch can be excavated at an average rate of 75 linear meters per hour. The two-step continuous technique to construct a U-shaped ditch, the quickest to build and hardest to cross, is shown below. Equipment for constructing tank ditches is found in the organizations shown in the Equipment for Construction table.

TWO-STEP CONTINUOUS CONSTRUCTION



EQUIPMENT FOR CONSTRUCTION OF TANK DITCHES

	LOCATION AND QUANTITY					
Equipment	Tank Battalion	Engineer Battalion (Armored/ Mechanized Division)	Engineer Company (Armored Cavalry Regiment)	Engineer Combat Battalion, Heavy	Engineer Combat Support Equipment Company (Separate)	Engineer Combat Battalion (Corps)
Tank-mounted dozer	3					
Combat Engineer Vehicle		8	3			
Scoop loader		8	2	6	4	10
Bulldozer		8	2	11	4	10
18-yard scraper				12	9	

Other Ways To Construct Tank Ditches

Heavy construction equipment is difficult to find on the battlefield. Commanders must often use expedient methods and other equipment to do the job. Some suggestions are as follows:

- **Tank-mounted dozers or combat engineer vehicles (CEV).**
- **Commandeered civilian construction equipment such as bulldozers, scoop loaders, backhoes, scrapers.**
- **Cratering charges obtained from ammunition supply point (ASP).**
- **Demolition kit, projected charge M157 obtained from ASP: intended use is clearing minefields; emplaced by tank towing, or pushing, in about 8 manhours, creating crater 100 meters long, 4 to 5 meters wide, 1 to 1.5 meters deep.**
- **A platoon using hand tools can dig a triangular ditch 4 meters wide and 2 meters deep at the rate of about 4 meters an hour, or a rectangular ditch of the same dimensions at 2 meters per hour.**

When An Enemy Attacks

To increase effectiveness of the tank ditch, *weapons must engage attacking vehicles and troops in predetermined order.* Without a plan to distribute fires, several weapon systems may fire at the same target simultaneously. This wastes ammunition and leaves other attacking weapons free to return fire on friendly positions. A set plan assures engagement of the most dangerous attacking weapons first. The primary goal of the tank ditch is to engage the attacker at a standoff distance beyond the effective range of his weapons, but within the effective range of your own. A tank ditch 2,500 to 3,000 meters in front of your position will keep attacking vehicles at bay and give defenders time to destroy them. TOW gunners should take advantage of the time by shooting first at targets which pose an immediate threat. Then they should shoot at targets that give the attacker a bridging or breaching ability. For example, if an IFV and a tank both appear from a treeline 3,000 meters away, kill the IFV first. The IFV is thin skinned. Therefore, you get an easier kill, eliminate an ATGM that can kill *you* at long range, and gain time to engage the tank before you get within his effective range. The following table shows a sample ranked target list for *TOW gunners.* Target priorities for tank crews would be different due to shorter effective ranges of tank main guns.

SAMPLE RANKED TARGET LIST FOR ATGMs

PRIORITY	WEAPON/EQUIPMENT	RATIONALE
1	Infantry fighting vehicles. Armored personnel carriers.	Thin-skinned vehicles; some mount ATGMs that can kill you at long ranges.
2	Bridge equipment. Tank-mounted plow. Mine-clearing equipment.	Enhance mobility; can bridge or breach ditches and minefields.
3	Tanks. SP artillery.	Shorter range, direct fire weapons (SP artillery often used in direct fire role).

Remember, the tank ditch is only a part of the obstacle plan, itself a part of the overall defense scheme. A tank ditch is effective only when integrated with minefields (dummy and real) and other reinforcing obstacles, and tied to natural terrain obstacles like swamps, steep slopes, or dense woods. Best effect depends on coverage of the tank ditch by direct and indirect fires.

Ordering TRADOC Bulletins

The TRADOC Bulletin series is published by HQ TRADOC to provide commanders with timely technical information on weapons, tactics, and training techniques. The bulletins are not intended to supplant doctrinal publications, but to supplement how-to-fight material with data derived from tests, intelligence, or other sources which probe "why?" TRADOC Bulletins are developed, using the most comprehensive and current military and civilian data available. Army Training and Evaluation Programs (ARTEP), Field Manuals (FM), and Training Circulars (TC) continue to be the primary training references. TRADOC Bulletins supplement them with an explanation of why we are training in a given manner. TRADOC Bulletins should enable commanders to better stimulate and motivate subordinates to understand why we train the way we do.

TRADOC Bulletins are cataloged in DA Pamphlet 310-3 (Index of Doctrinal, Training, and Organizational Publications). The series is numbered consecutively, and each TRADOC Bulletin is distributed by the US Army AG Publications Center to all pinpoint account holders who indicate a desire to receive them.

Additional copies can be requisitioned from the US Army AG Publications Center, Baltimore, MD 21220. Refer to DA Pamphlet 310-10-2 (The standard Army publications systems [STARPUBS]: Resupply Guide). DA Pamphlet 310-10 explains the pinpoint distribution system and how to establish or update an existing account at the US Army AG Publications Center.

TRADOC BULLETIN 13

28 MARCH 1980

DONN A. STARRY
General, United States Army
Commanding

DISTRIBUTION:

Active Army and USAR: To be distributed in accordance with DA Form 12-11 A & B, Requirements for the Infantry Battalions (Qty rqr block no 79); Tank Units, Platoon, Co & Bn (Qty rqr block no 129) and TRADOC Bulletins (Qty rqr block no 432).

ARNG: To be distributed in accordance with DA Form 12-11B, TRADOC Bulletins (Qty rqr block no 432).

Additional copies can be requisitioned from the US Army Adjutant General Publications Center, 2800 Eastern Boulevard, Baltimore, MD 21220.

U. S. GOVERNMENT PRINTING OFFICE : 1980 635-078/10

FORUM — YOUR TURN

There are occasional, persistent rumors going about that Army field manuals and doctrinal literature are written by nameless, faceless drones who wear starched wash and wear fatigues, and have only recently read about trench foot in dusty volumes in the TRADOC library. We'd like to prove these rumors wrong. In fact, we want to *give you the chance to influence doctrinal development.* Send us your comments on this bulletin and your ideas on current doctrine, weapons, tactics, and training problems that need resolution.

1. **Your rank** _____ **Branch** _____

   Component (Act, NG, Res) _____ **Type Unit** _____

   Level (Company, Battalion, etc.) _____

2. **Will your unit use this bulletin? If so, how?** _____

3. **How will this bulletin be useful to you personally? If not useful, why not?** _____

4. **How, if at all, did this bulletin change your perception of the modern battlefield?** (Check any or all.)

   ____ No change.

   ____ Helped convince me this is serious business.

   ____ Influenced me to try using the tactic/technique in training, where possible.

   ____ Convinced me that my unit's current training is deficient in this area.

   ____ Other.

5. **With what ideas proposed in this bulletin do you disagree? Why?** _____

6. **What single problem or subject of importance do you feel we should address in a future TRADOC bulletin?** _____

7. **If you could make just one change (better weapon, new technique) to improve how the Army fights on the modern battlefield, what would it be? Why?** _____

8. **Name and return address (optional).** _____

We are not a publications center and do not stock back issues of TRADOC Bulletins. These and other items in the how-to-fight literature series are indexed in DA Pamphlet 310-3. Additional copies can be ordered from the US Army AG Publications Center, 2800 Eastern Boulevard, Baltimore, MD 21220. Organizations other than Army should submit requests through their headquarters.

PLEASE—PASS THIS BATTLE REPORT TO A FRIEND.